

REMARKS

Claims 1-15 are pending in the case. All claims stand rejected. In the Final Office Action, the Examiner maintains the rejection of claims 1-15 based on the Ueno, Anton and Barlow references. Reconsideration is respectfully requested.

§103(a) Rejection

Claims 1, 6, 8, 9, 14 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over by Ueno et al. (US 5,334,829; hereinafter “Ueno”) in view of Anton (US 2003/0089957 A1). The Examiner contends that Ueno and Anton, in combination disclose all the limitations of the rejected claims. Applicant respectfully traverses the rejection.

More specifically, with respect to Ueno, the Examiner contends that in Fig. 1 of Ueno, “**substrate (3)** is an integral part of the image sensor (1)...since the CCD substrate (3) is an integral part of the CCD and cannot be separated...the CCD and its required components are directly attached to the heating element.” (Final Office Action, p. 2.) However, Applicant respectfully submits that the Examiner is **misreading Ueno. Element 3 in Ueno is NOT a substrate but a “substrate electrode”**. (See Ueno, Abstract and col. 4, ln. 13-15.) An electrode is defined as “a conductor used to establish electrical contact with a nonmetallic part of a circuit” (Merriam-Webster Dictionary). Therefore, **the substrate electrode 3 is NOT the substrate** of the CCD imaging device 1 but is an element in addition to the CCD imaging device 1. Ueno states that: “The CCD solid state imaging device 1 has a substrate electrode 3 of a plate-like configuration disposed on its lower surface.” (See Ueno, col. 4, ln. 13-15.)

Furthermore, Ueno illustrates substrate electrode 3 as a separate element in Figures 1 and 4 of the patent and in the cross-sectional view of Figure 3, substrate electrode 3 is clearly shown as a separate element from the CCD imaging device 1. Ueno further states that in Figure 3, “reference numeral 9c depicts an external pin for the substrate electrode 3.” Therefore, Ueno makes it clear that the **substrate electrode 3** is a separate element from the imaging device 1. As will be discussed in more detail below, Ueno describes placing the heating device 5 below the substrate electrode 3. Therefore, Ueno does not teach or suggest “the heater element being positioned on the first surface of the substrate and directly underneath the sensor area of the image sensor chip,” as recited in claim 1.

With respect to Anton, the Examiner continues to contend that Anton teaches that the image sensor chip being attached to the heater element and the first surface of the substrate using an epoxy glue being the gelatinous material RBC Epoxy (3). The Examiner refers to paragraph [0017] of Anton which **actually directly contradicts the Examiner's assertion.**

Anton states in paragraph [0017] that:

The adhesive layer 5, e.g. a UV curable adhesive, is again placed so as to form a closed well around the perimeter of the placement of the integrated optical device 1. The well thus formed is filled with a gelatinous material containing a metallic second phase 11. The metallic second phase may be composed of a number of suitable metals, including silver, copper, iron, nickel or cobalt. **The gelatinous material is again preferably thixotropic.** Several such gelatinous materials are available, such as Sylgel 1612 (Wacker Chemical) and RBC-6100 (RBC Epoxy). (Emphasis added.)

As Applicant explained in the last response to office action, the term “thixotropic” means “the property of various gels of becoming fluid when disturbed.” Therefore, the gelatinous material is fluid and **does not provide any adhesive function.** The adhesive function is provided only the adhesive layer 5 which is a UV curable adhesive.

Furthermore, **the Anton reference must be read as a whole.** Anton in paragraph [0013] explains the construction of the “well” for containing the gelatinous material: “FIG. 2 also shows **side walls 5 of an adhesive material**, e.g. a UV curable adhesive. **These are used to adhere the integrated optical device 1 to the ceramic support 2.** The UV curable adhesive side walls 5 **also serve to provide a containment surround for the gelatinous material 2** contained therein” (emphasis added). Anton went on to explain in paragraph [0015] that “[t]he **UV curable adhesive 5** is placed on the ceramic substrate 2 such that it **forms a closed well around an area where the gelatinous material 3 is to be placed.** The thixotropic gelatinous material 3 is then placed within the well created by the adhesive 5 and **is thus contained therein...**The now viscous gelatinous material 3 serves to convey heat from the heating elements 4...The **gelatinous material 3 thus acts as a heat spreader**” (emphasis added).

It is imperative to note that Anton describes attaching heating elements 4 to the bottom side of a ceramic substrate and then providing the gelatinous material to the top side of the ceramic substrate. The optical device 1 is then placed on top of the gelatinous material.

Therefore, Anton does not cure the deficiency of Ueno as Anton does not teach or suggest the image sensor chip being attached directly to the heater element and the first surface of the substrate using an epoxy glue, as recited in claim 1.

Claim 1 is patentable over Ueno and Anton at least by reciting “the heater element being positioned on the first surface of the substrate and directly underneath the sensor area of the image sensor chip to be assembled in the package, the image sensor chip to be placed directly on the heater element” and “the image sensor chip is attached directly to the heater element and the first surface of the substrate using an epoxy glue so that the heater element is sandwiched directly between the sensor area of the image sensor chip and the first surface of the substrate to provide direct and localized heating of the sensor area of the image sensor chip.”

In the integrated circuit package of claim 1, the heater is disposed on the first surface of the substrate and is positioned directly below the image sensor chip without any intervening layers. Therefore, the heater provides **direct heating** to the image sensor chip.

Ueno, to the contrary, describes forming the heating device 5 **under the substrate electrode 3** and under the electrically insulating material 4. Thus, in the structure of Ueno, the CCD chip 1 is **not attached directly** to the heating device and the heating device is **not sandwiched directly** between the CCD chip 1 and the package substrate 2. Rather, in Ueno, the heating device is separated from the CCD chip 1 by at least two intervening layers – **the substrate electrode 3 is NOT part of the CCD chip**. Ueno fails to teach or suggest the limitations of claim 1 where the image sensor chip is attached directly to the heating element and the heater element is sandwiched directly between the image sensor chip and the substrate.

Anton does not cure the deficiency of Ueno. Furthermore, Anton does not teach or suggest using “an epoxy glue” to attach the image sensor to the heater element, as recited in claim 1. As explained above, Anton in fact does not teach or suggesting using any epoxy material for the purpose of adhesion. The epoxy material mentioned in Anton is used only for heat spreading.

For at least the above reasons, claim 1 is patentable over Ueno and Anton. Claims 6, 8, 9, 14 and 15, dependent upon claim 1, are patentable over the cited references at least for

the same reasons claim 1 is patentable. Withdrawal of the §103(a) rejection is respectfully requested.

§103(a) Rejection

Claims 4 and 5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ueno in view of Anton. Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ueno in view of Ozimek et al. (US 5,865,935). Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ueno in view of Ito et al. (US 2003/0164365 A1). Claims 11-13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ueno in view of Barlow et al. (US 4,420,261; hereinafter “Barlow”). Applicant respectfully traverses the rejection.

Claims 4-5, 7, 10 and 11-13, dependent upon claim 1, are patentable over Ueno and Anton at least for the same reasons claim 1 is patentable. The cited references do not cure the deficiency of Ueno and Anton. Claims 4-5, 7, 10 and 11-13 are therefore patentable over the cited references.

For the reasons stated above, withdrawal of the §103(a) rejection is respectfully requested.

CONCLUSION

Claims 1, 4-15 are pending in the present application. For the reasons stated above, the claims are patentable over the cited references and are in condition for allowance. If the Examiner would like to discuss any aspect of this application, the Examiner is invited to contact the undersigned at (408) 382-0480.

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